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Effect of Chitin biosynthesis inhibitor-diflubenzuron on the fifth instar larvae of *P. ricini* Fabr

L.S. NATHAN AND R.J. NATHAN

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See end of the article for authors' affiliations

Correspondence to :
L.S. NATHAN
Department of Zoology, Ewing Christian College, Gaughat, ALLAHABD (U.P.) INDIA

ABSTRACT

Fifth instar larvae of *Pericallia ricini* Fabr. (Lepidoptera, Arctiidae) were fed on the leaves of castor plant (*Ricinus communis* L.) treated with different concentrations of diflubenzuron. Larval mortality of 86.95% was recorded at 100 ppm level. Abnormalities on the body of adult were reported due to the toxicity of chemical. Abnormal adults who could not stretch their wings properly with swollen thoracic region, appeared at 50 ppm level of diflubenzuron. Maximum deformity was recorded at 10 ppm level. The larval and pupal life span was increased by 12 and 34%, respectively at 10 ppm level. The chemical has also affected the food intake capacity and growth of larvae and pupae. Maximum food intake, growth and approximate digestibility were manifested at the lowest concentration of the chemical.

Key words : *Pericallia ricini, Ricinus communis*, Diflubenzuron-Chitin biosynthesis inhibitor, ppm (parts per million)

Pericallia ricini is found all over India and is commonly known as castor hairy caterpillar. It is a serious pest of oil seed plant, castor and cucurbitaceous crops. The female moths lay eggs in large number on the lower surface of leaf. The larvae feed on young and full grown plant leaves and fruits. In heavy infestation only stem and branches are left behind.

In past many research workers attempted to study the lethal influence of chitin biosynthesis inhibitors on agricultural insect pests and reported almost complete lethal action by these chemicals (Gupta and Verma, 1992 and Baringbing and Karmawati, 1992) but the adequate literature is still lacking on the loss of crop by these pests which survive after exposure with these chemicals. Hence, the objective of the present research was to find out, the extent of crop damage done by the insect pest which avoid lethal dose of chitin biosynthesis inhibitor. Besides food consumption, growth of treated larvae was also studied as the reproduction of malformed individual is drastically affected and their population is checked to reach economic injury level.

MATERIALS AND METHODS

The eggs of *P. ricini* Fabr. were collected from castor leaves and reared in the laboratory on castor leaves. Eggs were kept between two leaves in the wooden cages, (60×60×45cm) and fresh clean fleshy leaves were provided daily. After hatching, larvae started feeding on fresh leaves, the excreta and other waste were removed daily from cages. For the protection of larvae from ants, the rearing cages were placed on water filled pots (Earthen cups) Larvae were reared till the pupa formation. Freshly emerged adults were transferred to separate jar, for ovipositor. Honey mixed sugar solution (10%) soaked in a cotton ball, was provided in the plastic cavity (2×2×1cm) for feeding the adults. Fresh castor leaves were placed in the glass chimney for egg laying. The females laid eggs on leaf surface; such leaves along with eggs were transferred into another glass jar. The eggs were kept between fresh succulent castor leaves to provide food for hatching larvae easily and also to prevent leaves from rapid evaporation. Fifth instar larvae of *P.ricini* were separated from the cages and were starved at least for six hours as the least variation in results is exhibited due to suitable starvation before treatments. Starvation also assures that all experimental insects feed on treated food. The larvae fed on castor leaves which were dipped in volatile solution of chemical at different concentrations.

To find out the toxicity of chemical, mortality, deformity, longevity, food consumption, growth and approximate digestibility was recorded.

Due to interaction of chemical in the biosynthesis of chitin in experimental insects, the mortality in different treatment was observed during the period of investigation. Moribund test insects were also considered as dead. Net mortality was calculated after necessary correction by using Abbott's formula (1925).

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